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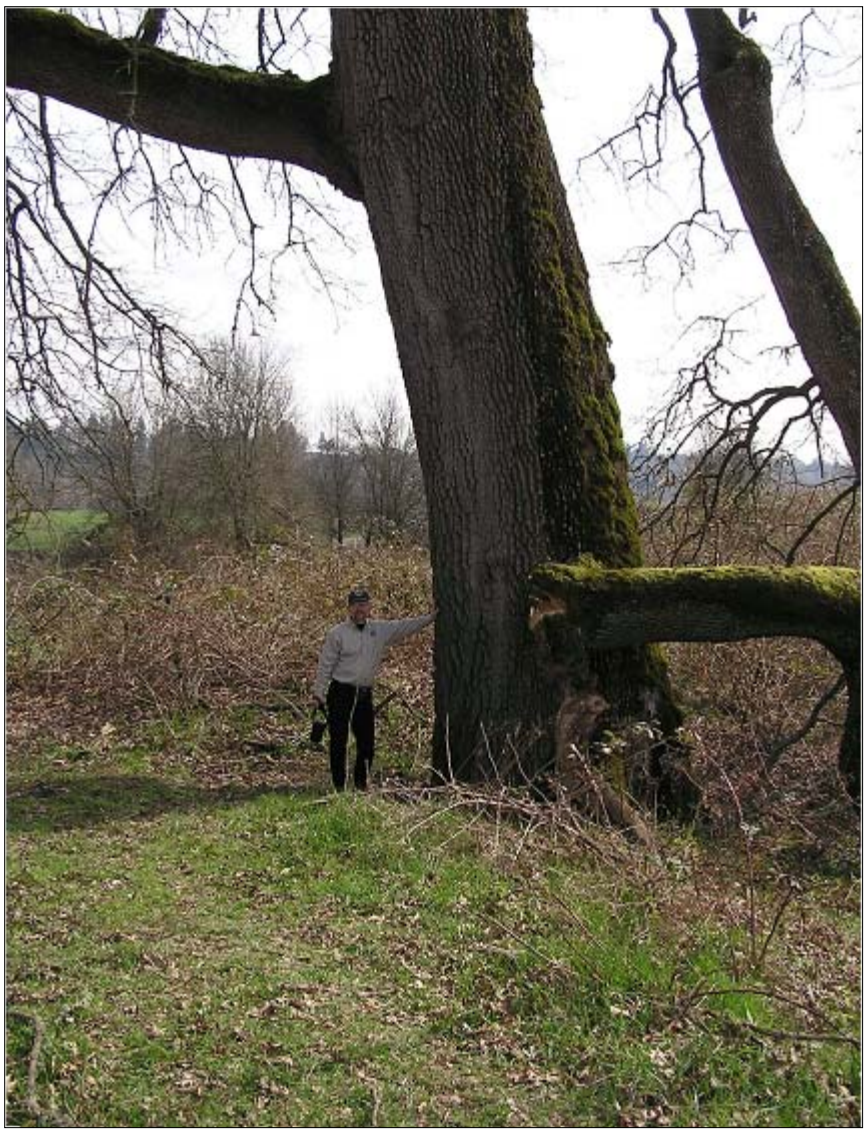
SHILLAPOO WILDLIFE AREA MANAGEMENT PLAN

Washington Department of Fish and Wildlife



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CHAPTER I. INTRODUCTION

This plan provides management direction for the Shillapoo Wildlife Area. This plan will be updated annually to maintain its value as a flexible working document. It identifies needs and guides activities on the area based on the Washington Department of Fish and Wildlife (WDFW) Agency Mission of "Sound Stewardship of Fish and Wildlife" and its underlying statewide goals and objectives as they apply to local conditions.

1.1 Agency Mission Statement

The Washington Department of Fish and Wildlife serves Washington's citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable fish and wildlife-related recreational and commercial opportunities.

1.2 Agency Goals and Objectives

The underlined goals and objectives directly apply to the management of this wildlife area. These goals and objectives are found in the Agency's Strategic Plan.

Goal I: Healthy and diverse fish and wildlife populations and habitats

- Objective 2: Protect, restore and enhance fish and wildlife populations and their habitats.

Goal II: Sustainable fish and wildlife-related opportunities

- Objective 6: Provide sustainable fish and wildlife-related recreational and commercial opportunities compatible with maintaining healthy fish and wildlife populations and habitats.

Goal III: Operational Excellence and Professional Service

- Objective 11: Provide sound operational management of WDFW lands, facilities and access sites.

1.3 Agency Policies

The following agency policies provide additional guidance for management of agency lands.

- Commission Policy 6003: Domestic Livestock Grazing on Department Lands
- Policy 6010: Acquiring and disposing of real property
- Policy 5211: Protecting and Restoring Wetlands: WDFW Will Accomplish Long-Term Gain of Properly Functioning Wetlands Where Both Ecologically and Financially Feasible on WDFW-Owned or WDFW-Controlled Properties
- Policy 5001: Fish Protection At Water Diversions/Flow Control Structures And Fish Passage Structures
- Policy: Recreation management on WDFW Lands
- Policy: Commercial Use of WDFW Lands
- Policy: Forest Management on WDFW Lands
- Policy: Weed Management on WDFW Lands
- Policy: Fire Management on WDFW Lands
- Other policies/contractual obligations/responsibilities

1.4 Shillapoo Wildlife Area Goals

Management goals for the Shillapoo Creek Wildlife Area are to preserve habitat and species diversity for both fish and wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities, and provide diverse opportunities for the

public to encounter, utilize, and appreciate wildlife and wild areas. Specific management goals and objectives for the Shillapoo Wildlife Area can be found in Chapter 3.

1.5 Planning Process

A multifaceted approach has been undertaken to identify strategies proposed for management of the Shillapoo Creek Wildlife Area. This process included identifying agency goals and objectives that apply to the area; a review of the purpose for purchasing the area; a review of existing habitat conditions and species present; the formation of a Wildlife Area Citizens Advisory Group (CAG); and input and review by an internal District Team consisting of local agency representatives from each agency program. The district team also helped to identify other species or habitat plans and documents pertinent to the management of the area.

Public participation, through the formation of the CAG, will be used as an ongoing means to identify social, cultural, and economic issues important to the people of Washington and the management of the wildlife area. The group will also provide input to help resolve current and future management issues and conflicts. CAG participation in planning will add credibility and support for land management practices and help build constituencies for wildlife areas. The CAG is made up of one representative from each major stakeholder group. CAG members are spokespersons for their interest groups.

<u>Shillapoo Wildlife Area Citizens Advisory Group Representation</u>
Adjoining Landowner/Lessee
Diking District
Vancouver Wildlife League
Vancouver Audubon
Washington Waterfowl Association (SW WA Chapter)
Ducks Unlimited Biologist
Local Ducks Unlimited Chapter member
Dog Trainers
Pheasants Forever
Columbia Land Trust
Vancouver/Clark Parks
Port of Vancover
Clark County Weed Management
US Fish and Wildlife Service

Plans will incorporate cross-program input and review at the regional and headquarters level by the habitat program, wildlife program, enforcement program, and fish program. Pertinent information from existing species plans, habitat recommendations, watershed plans, ecoregional assessments, etc will be used to identify local issues and needs and ensure that the specific Wildlife Area Plan is consistent with WDFW statewide and regional priorities.

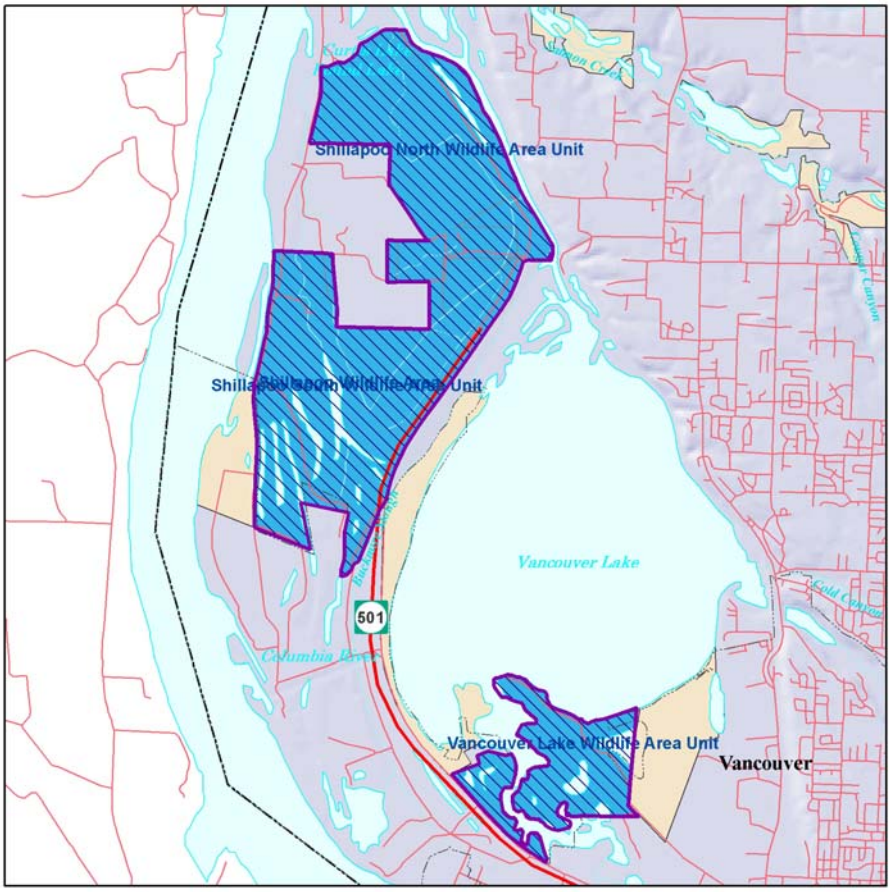
The Shillapoo plan will be reviewed annually with additional input from the CAG and district team to monitor performance and desired results. Strategies and activities will be adapted where necessary to accomplish management objectives.

CHAPTER II. AREA DESCRIPTION AND MAP

2.1 Property Location and Size

The 2,371-acre Shillapoo Wildlife Area (SWA) is located in Clark County in Southwest Washington and is comprised of Sections 24-25 and 36 T3N R1W, Sections 1 and 12 T 2N R1W, Sections 6-8, 17-18 T 2N R1E, and Sections 19, 30-31 T3N R1E.

Figure 1: Shillapoo Wildlife Area Map.



2.2 Purchase History and Purpose
This Wildlife Area (WA) was originally established in 1952 with the purchase of 277 acres between Shillapoo Lake and the Columbia River. Other parcels were added over time, but primarily in the 1990's, to bring the wildlife area to it's current size.

The 1,012-acre South Unit includes three acquired properties that historically were used for dairy production. One of the parcels is the original 277-acre property acquired in 1952. The other two properties consisting of 281 and 454 acres respectively were acquired in 1991 with WWRP funds. The 281-acre property is the site of one of the largest great blue heron rookeries on the lower Columbia River. In 2000, this rookery contained more than 350 active nests however by 2001 the nesting site was abandoned most likely due to the drought conditions affecting forage conditions or due to an increase in bald eagle activity in the area. A second newer rookery, also on the south unit, grew substantially to 142 active nests in the same year.

The 882-acre North Unit includes the three most recent properties acquired by WDFW (the acreages that follow total 882-acres): 60 acres acquired in 1994 with WWRP and Ducks Unlimited funds, 612 acres acquired in 1998 with WWRP and BPA funds, and 210 acres acquired with BPA funding in 2001. This Unit includes the northern and eastern portions of the drained Shillapoo Lakebed and approximately 1½ miles of shoreline on Lake River.

The 477-acre Unit at the south end of Vancouver Lake was acquired as two separate parcels. The first 170-acres was acquired from Alcoa Company and DNR which included about half of the south shore of Vancouver Lake. At the time of purchase, this was the only public access to the lake. The second acquisition of 307-acres also was purchased from the Alcoa Company with WWRP funds in 1991. This Unit is very popular with the public and receives a wide variety of uses due to its close proximity to the City of Vancouver.

Area History
Prior to agricultural development, the Vancouver Lowlands, where the SWA is now located, were a diverse mixture of both herbaceous and forested wetlands, oak woodland, and riparian habitat. Shillapoo Lake was a dominant feature of the landscape. A large Native American population existed in the area. Wapato, a native wetland plant, was a key staple of their diet. Lewis and Clark noted these villages in their journals and the abundance of waterfowl in the area whose calls kept them awake at night. Today, control of flows in the Columbia River, diking, draining and clearing for agricultural uses have significantly altered the vegetative landscape and composition of plant species, facilitating the introduction and proliferation of non-native plants in many areas.

The Vancouver Lowlands is a geographically low-lying area located in Southwest Washington within Clark County. The area is north west of the City of Vancouver. The area is comprised of the Columbia River flood plain beginning near the city limits of Vancouver and extending northward to the mouth of the Lewis River.

The construction of dams upstream on the Columbia River has reduced water fluctuations and virtually eliminated annual flooding that once occurred here. This drier condition has allowed both agricultural and industrial development to expand further into the area, which has also been altered by the construction of dikes throughout the area. The dams and dikes have not completely eliminated the potential for flooding as was seen during the 1996 flood. This event overtopped and

breached dikes resulting in flooding that had both positive and negative impacts on wildlife habitats. The flood depth and duration was sufficient to kill reed canary grass in many wetland areas and allow native plants, including Wapato, spike rush, smartweed and others, to temporarily re-colonize in some areas. The flood also had negative effects on pastures and other areas by eliminating some desirable plants allowing weeds to increase in some instances.

This area has undergone major changes in the past 50 years. The most significant change was the draining of Shillapoo Lake and its development as agricultural and pasture land. This was made possible by the construction of dikes around the area and the installation of a pump that drains the lakebed except during the winter months when some surface water generally accumulates.

A similar project was proposed for nearby Vancouver Lake, but this was abandoned in favor of an idea to develop the lake into an inland harbor. The proposed inland harbor project was never undertaken, but a project was attempted to improve water quality within the lake. This involved dredging deeper water areas in the lake and the construction of a flushing channel to circulate more fresh water through the lake. This project reportedly has had little impact on water quality in the lake.

Other past development plans in the area included a heavy industrial park and a major airport that would have been located in the Shillapoo lakebed.

A planning/zoning process challenged development plans in 1986. A consortium, made up of citizens and agency representatives, created a zoning plan for the lowlands, which was adopted by the Clark County Board of Commissioners. This plan included a large area zoned as agriculture/wildlife. Much of the land within this zone had previously been zoned for industrial development. Uses permitted under this designation are quite restrictive. Recently the City of Vancouver annexed all of the Port lands raising some concern that development may take place that otherwise may not have occurred. The proposed Columbia River Channel Deepening Project may help to speed development of some of the Port's lands by providing large quantities of fill material needed to develop the area for industrial uses.

General History and Description of the Vancouver Lowlands Area

The Vancouver Lowlands are located in Southwest Washington in Clark County. The area is north and west of the City of Vancouver. The area is comprised of Columbia River flood plain beginning at the city limits of Vancouver and extending northward to the mouth of the Lewis River.

Most of the northern portion of the lowlands is within the boundaries of the 5147 acre Ridgefield National Wildlife Refuge. The area to the south encompasses lands owned primarily by WDFW, Clark County, The City of Vancouver, The Port of Vancouver, The Washington Department of Natural Resources (DNR), five major private landowners and other small private ownerships.

The Vancouver Lowlands is an area that has undergone major changes in the past 50 years. The most significant change was the draining of Shillapoo Lake and its development as agricultural and pasture land. This was made possible by the construction of dikes around the area and the installation of a pump which constantly keeps the area drained except for the winter months when some water generally accumulates.

A similar project was proposed for nearby Vancouver Lake, but this was abandoned due to a desire to develop the lake into an inland harbor. The proposed inland harbor project was never undertaken, but a project was attempted to improve water quality within the lake. This involved dredging deep water areas in the lake and the construction of a flushing channel to circulate more fresh water through the lake. This project reportedly has had little impact on water quality in the lake.

The construction of dams upstream on the Columbia River has reduced water fluctuations and virtually eliminated periodic flooding that once occurred here. This drier condition has allowed both agricultural and industrial development to expand further into the area which has also been altered by the construction of dikes throughout the area. The dams and dikes have not completely eliminated the potential for flooding as was seen during the 1996 flood. This event broke dikes in two major locations and had both positive and negative impacts on habitats. The flooding and duration were sufficient to kill reed canary grass in many wetland areas allowing native plants, including wapato, spike rush, smartweed and others, to re-colonize in some areas. The flood also had negative effects on pastures and other areas by eliminating some desirable plants allowing weeds to increase in some instances.

Currently, industrial development has been limited to the area south of the Vancouver Lake flushing channel. However, the Port of Vancouver owns land north of this line that is currently proposed to be used as an industrial park and potentially some recreational uses. WDFW has been unsuccessful in past attempts to purchase this land. WDFW's Habitat, Wildlife and Lands programs have worked closely with the port in their planning processes to encourage the protection of this area's most sensitive habitats. Other past development plans in the area have included a heavy industrial park and a major airport which would have been located in the Shillapoo lakebed. These development plans were thwarted largely by a planning/zoning process in 1986.

The HABITEK consortium, made up of citizens and agency representatives, created a zoning plan which was adopted by the Clark County Board of Commissioners. This plan included a large area zoned as agriculture/wildlife. Approximately one half of the lowlands are in this designation. All uses permitted under this designation are quite restrictive. Recently the City of Vancouver annexed all of the port lands raising some concern that development may take place that otherwise may not have occurred. The proposed Columbia River Channel Deepening Project may help to speed development of some of the port's lands by providing large quantities of fill material needed to develop the area for industrial uses.

Some recreational development has taken place here as well. Two major county parks are located on the west shore of Vancouver Lake and on the Columbia River. They have also aggressively pursued purchase of shoreline areas around Vancouver Lake and riparian zones along two creeks that feed the system. This open space acquisition program has helped to protect many sensitive habitats in the area.

For many years, WDFW has undertaken efforts to protect and restore important wildlife habitat in this area. In the 1940s the Department of Game (now WDFW) recognized a need for a major WA in the Vancouver Lowlands. A plan was developed listing properties that should be acquired, which included lands in and around Shillapoo Lake. Prior to 1991 the department accomplished

little in the area of habitat acquisition. The 277-acre WA and 170-acre Vancouver Lake access area were the only lands that had been purchased.

In the 1990's monies provided through the Washington Wildlife and Recreation Program (WWRP), BPA and Ducks Unlimited (DU) were used to acquire additional lands in the area. A total of 1,924 acres, acquired in five parcels, have been secured through these funding sources. The top priority for WDFW's acquisition program is to acquire the remaining portions of the Shillapoo Lakebed that are privately owned so the lake that WDFW can manage and restore the wetland habitat.

While the development of the area for agriculture destroyed large quantities of native habitat, it also created habitat in a different form. Agricultural lands today are seen as important habitat, particularly for Canada geese and other waterfowl. While restoring much of the native habitat in this area is a high priority, maintaining some level of agriculture in the area is also considered very important.

WDFW Management History

Shillapoo Wildlife Area "Entrance Sign" and hawk.

Given that the vast majority of the Shillapoo Wildlife Area's (SWA) land was recently acquired the wildlife area is in various stages of development as wildlife habitat. Sharecrop and grazing agreements with local farmers and ranchers has been used to maintain important habitat for migrating and wintering waterfowl and Sandhill cranes. Eventually these agricultural lands will be restored to wetland habitat.

In the initial stages of management, WDFW used various non-state fund sources for habitat enhancement and improvement activities. Wetland restoration efforts have already taken place and other improvement projects are being planned and designed with the aid of outside funding sources from Ducks Unlimited, the Natural Resources Conservation Service, US Fish and Wildlife Service and Clark Public Utilities, and ready for implementation.

In 1999, an improvement project was completed. This project consisted of numerous water control structures and the installation of a pump designed to extend the hydro-period of the wetland basin to favor native plant communities and to control reed canary grass. To date this, the success of this

project has been marginal due to unforeseen limitations of the pump that delivers the water to the wetland basin, which is located at the Columbia River.

Also in 1999, water control levees and structures were constructed within the Vancouver Lake Unit. These structures were of little use until 2004 when water supplied by the Clark Public Utilities was installed to provide water to the wetland basins and adjacent wetland sites, managed by Vancouver/Clark Parks.

In 2004, the first phase of restoring the wetland vegetation at the Shillapoo Lakebed was partially completed. The intent of this project in collaboration with Ducks Unlimited and NRCS was to build a water control levee to isolate and to prevent the drainage of 150-acre at the south end of the historic water body. This project has been delayed due to opposition from a pipeline company that currently has an easement through the site. Revised project plans are being considered but the pipeline issue will have to be addressed in order for future restoration activities in other parts of the lakebed can take place.

In cooperation with the US Army Corps of Engineers another project is in the design stage that involves restoring the wetland hydrology to the remaining parts of the lakebed that are owned by WDFW.

At present, the SWA is now a part of the Bonneville Power Administration's (BPA) Wildlife Mitigation Program, which funds most of the activities on the wildlife area. Future restoration and enhancement will also be funded through this program. These efforts are just getting under way and will include many of the activities identified later in this plan.

Ownership and Use of Adjacent Lands

Most of the northern portion of the lowlands is within the boundaries of the 5,147-acre Ridgefield National Wildlife Refuge. The area to the south includes the Shillapoo Wildlife Area owned by WDFW, and lands owned by Clark County, the City of Vancouver, the Port of Vancouver, the Washington Department of Natural Resources (DNR), - a few other small private ownerships and one major private landowner.

Currently, industrial development has been limited to the area south of the Vancouver Lake's flushing channel. However, the Port of Vancouver (Port) owns land north of this channel and they are planning to use this area as mitigation for development in other areas. WDFW's Habitat and Wildlife Lands Programs have worked closely with the Port on their planning process to encourage the protection of this area's most sensitive habitats. One key component to the development of this mitigation plan is to provide habitat for migrating Sandhill cranes.

Some recreational development has taken place here as well. Two major County Parks flank the wildlife areas South Unit and are located on the west shoreline of Vancouver Lake and on the Columbia River. The County has also aggressively pursued purchase of the shoreline areas around Vancouver Lake and riparian zones along two creeks that feed into the lake system to preserve open space. The County's Open Space Acquisition Program has been very valuable in protecting many sensitive habitats in the area. Key open space lands are situated just east of and adjacent to the wildlife area's Vancouver Lake Unit. WDFW has provided assistance to County Parks and others interest groups in the area to restore wetland habitat. The Clark Public Utilities has provided

the water supply needed to successfully manage the wetland basins on the County Parks and WDFW properties.

2.3 Funding

Most of the funding for management of the WA comes from the BPA Wildlife Mitigation Program. Other state funding sources and various grants are used to finance a small portion of some routine activities that are not eligible for mitigation dollars. The budget for federal fiscal year 2006 is $253,430, which supports operations and maintenance including salaries

Portions of two staff positions and temporary labor are supported by the BPA Mitigation funds. They include a Wildlife Area Manager, an Assistant Wildlife Area Manager.

2.4 Climate

The climate is mild in this area and is characterized by relatively warm summers and cool wet winters. Average annual precipitation is 39 inches. The average daily low and high temperatures are 44.2 and 62.7 degrees Fahrenheit respectively. The average annual snowfall is 5.9 inches. Prevailing winds are from the northwest in the spring and summer and the southwest in the fall and winter.

2.5 Soils and Geology

Soils in the area are primarily of the Sauvie–Puyallup association. The Clark County soil survey describes these, as "deep, nearly level to gently sloping, somewhat poorly drained to excessively drained, moderately fine textured to moderately coarse textured soils of the flood plain." They were formed by deposition of water borne material. The major soil types in the area are considered hydric, a classification of soils common in wetlands.

2.6 Hydrology and Watersheds

The wildlife area lies within the Lake River sub-basin and is entirely within the floodplain of the Columbia River. Annual flooding and scouring which formed the area's topography has been substantially reduced from pre settlement conditions. This is due to hydropower and irrigation projects upstream on the Columbia and Willamette Rivers and their tributaries as well as flood control levees.

The frequency and duration of high water events are not the only critical hydrologic element that the dams and dikes have altered. The timing of high water events have also changed and may be a key factor, largely unrecognized, in why plant communities have changed and now are often dominated by exotics. Historically the high water events in this area occurred in May and June. These "spring freshets" that generated these high water events are now almost unnoticeable as the mountain snowmelt is captured and used by irrigation projects upstream.

The wildlife area's Vancouver Lake Unit is one example of how the Lower Columbia River's altered hydrology has led to major changes in vegetative communities. The Mulligan Slough area that has not been actively managed for many years is dominated by large stands of willow, ash and cottonwood. This same area in 1928 aerial photographs looks much different consisting of large areas of mudflat and herbaceous vegetation that probably provided excellent shorebird and waterfowl habitat.

2.7 Vegetation Characterization

The vegetation of the Shillapoo Wildlife Area and surrounding area has been altered significantly from historic conditions by regional as well as local influences. In addition to changes in hydrology and the introduction of exotic plants much of the land has been drained, cleared and leveled to make way for agricultural production, industrial development and other uses.

As a result, the area is a mix of agricultural land and developed pasture intermixed with fragmented pieces of natural habitat of varying quality. Himalayan blackberry and Reed canary grass are the two exotic plants that are playing the largest role in limiting habitat quality in almost all habitat types. Interestingly, neither of these plants would be nearly as competitive with native species under the Columbia River's historic annual hydrologic cycle. Because of the changed environment both of these plants pose long-term management problems.

2.8 Important Habitats

Riparian habitat in background

Riparian—Areas adjacent to flowing water that support both aquatic and terrestrial life forms. These areas provide cover, create stream channel diversity and provide bank stability and generally support a wider diversity of fish and wildlife than surrounding habitats.

Emergent Wetland—Areas with surface water present or saturated soils during a portion of the growing season that generally support primarily herbaceous hydrophytic plants. Like riparian areas, wetlands generally support a high diversity of fish and wildlife species.

Forested Wetland—Similar to emergent wetland except dominated by trees. Also support relatively high diversity of wildlife species.

Oak—Upland areas with Oregon White Oak as the dominant species. An important habitat for a number of species across the state with depressed populations.

2.9 Fish and Wildlife

Waterfowl Staging Area

Among many other species, the SWA supports breeding and wintering Canada geese, mallard and other dabbling ducks, mink, great blue heron, black-capped chickadee, western meadowlark, and yellow warbler. These species were identified as "indicator" species in the construction and loss assessments for Bonneville, The Dalles and John Day dams and are used to guide mitigation efforts on the SWA. Bald Eagles (Federally Threatened) and Sandhill Cranes (State Endangered) are both found on the wildlife area. Eagles nest in adjoining areas and can be present in significant numbers on the wildlife area particularly in winter. Sandhill Cranes use the wildlife area and surrounding lands primarily as a staging area during the fall and spring but a few over winter in the area. Listed salmonids found in the Columbia River, Lake River, and Vancouver Lake adjacent to the wildlife area lands include Lower Columbia Coho (Threatened), Chinook Salmon (threatened), Columbia River Chum Salmon (threatened), Snake River Sockeye (Endangered) and Steelhead (threatened). Shillapoo is also within the historic range of the Columbian white-tailed deer and Western pond turtle (both state endangered) and is considered potential habitat for both species. This is also a major wintering area for waterfowl in the pacific flyway as well as an important staging/wintering area for Sandhill cranes. This site is part of a larger area that supports over 200,000 waterfowl during the winter period and over 300,000 during migration periods. See **Appendix 5** for a complete listing of birds that frequent the Shillapoo Wildlife Area

CHAPTER III. MANAGEMENT OBJECTIVES, ISSUES & STRATEGIES

Statewide goals, and objectives listed in Chapter 1 shape management priorities on wildlife areas. Specific wildlife area information including why the area was acquired, habitat conditions, species present, and public issues and concerns were evaluated to identify wildlife area activities or strategies. *Public issues from past planning efforts and the Wildlife Area Advisory Group are noted in italics.*

Many of the identified activities will benefit listed species using the site or that potentially could expand their ranges into the area. For example Bald Eagles and listed salmonids will benefit from riparian enhancements and Sandhill Cranes may benefit from agricultural activities and the many wetland enhancements planned. If reestablished on the site, planned restoration of native habitats would benefit Western pond turtles and Columbian white-tailed deer.

WDFW's management goals for the Shillapoo Wildlife Area are described below under corresponding agency objectives. Tasks and strategies are listed which further define the location, anticipated time frame, and scope of activities which need to take place in order to achieve each goal. Items that are considered to be unfunded are underlined in the text.

Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats

1. Improve and protect wintering waterfowl habitat, with an emphasis on wetland restoration and management, throughout the Shillapoo Wildlife Area.

The Shillapoo Wildlife Area was acquired with the express purpose of protecting and restoring habitat for migratory waterfowl, particularly Canada geese, especially noting the area's potential for wetland restoration. This is an important facet of the agency's effort to aid in the recovery of the dusky subspecies and to help alleviate agricultural damage on private lands.

A. Strategy: Reestablish wetland hydrology to approximately 900 acres within the Shillapoo lakebed by the end of FY 2007 and begin management for beneficial moist soil plants.[1]

Task: Complete the sub-impoundment of approximately 130 acres within the lakebed on the South Unit by constructing a levee and associated control structures by the end of FY 2007.

Task: Develop 2 sub-impoundments totaling approximately 470 acres within the North Unit, by constructing levee(s) and associated structures within the lakebed area by the end of FY 2007.

Task: Develop two sub-impoundments within the lakebed totaling approximately 369 acres on the New Columbia Gardens Unit by the end of FY 2008. (Contingent upon acquisition)

In the event this area is not acquired, work with the landowner to develop a system that allows continued draining of private agricultural lands while still maximizing, to the fullest extent possible, wetland acreage on WDFW lands within the lakebed.

[1]The initial development of these planned major improvements would be completed in partnership with the US Army Corps of Engineers, Ducks Unlimited and others.

Task: Determine feasibility of utilizing the existing expulsion pump or portable pumps to reroute or recycle water from the draining of one or more cells to maintain water levels in other cells. Implement if determined to be a cost effective means of improving wetland management.

B. Strategy: Reestablish wetland hydrology on approximately 240 acres and begin management for moist soil plants on numerous smaller wetlands, which are not included in the Shillapoo Lakebed enhancement area.

Task: Install control structures to restore an 80-acre wetland within the North Unit by the end of FY 2007. Assess the potential for further enhancement to basins within the northern part of the unit to include the need for a water supply (well or pump).[2]

Task: Operate the water delivery system within the Vancouver Lake Unit to favor early successional native wetland plants. Begin implementation of other moist soil management practices in areas where water management is not sufficient to achieve the desired results.

Note: During high water events fish access into the Vancouver Lake wetland management basins is possible. Measures to assure fish can passage out of these basins are currently being considered by WDFW's Technical Applications Division.

Task: Consider a cooperative agreement with the landowners to cooperatively manage wetland basins within the Vancouver/Clark Parks south Vancouver Lake Area where the water supply is shared with WDFW by the end of FY 2007.

Task: Install appropriate structures and water supply to enhance/restore a 12-acre wetland within the North unit by the end of FY 2007.

Task: Develop specific goals and vegetation management measures for each individual wetland basin once the effectiveness of water management in each basin is evaluated.

C. Strategy:Implement moist soil management practices on an estimated 155 acres within the South Unit by the end of FY 2007.

Task: Make modifications to the existing South Unit water supply that will make it an effective management tool. Once adequate hydrologic control is established, manage water levels and implement other moist soil management practices on approximately 33 percent of wetlands annually through FY 2007 and subsequently repeat treatments on an as needed basis to control exotic plants and favor native plant communities.

It should be noted that the design flaw that limits the usefulness of the pump located along the Columbia River is a fish protection issue, which takes precedence over the delivery of water to the wetland basins. Because screen approach velocities exceed legal limits below specific river levels, which has been the case more often than anticipated, the pump cannot be operated.

[2] The initial phase and potentially future phases of this action would be completed in partnership with Ducks Unlimited

Recommendations for modifications are being developed to correct the problem.

D. Strategy: By the end of FY 2006, rehabilitate or improve management of an estimated 950 acres of pasture and agricultural areas located throughout the Shillapoo Wildlife Area that will remain following native type habitat developments in order to continue to provide a diverse forage base critical to management of Sandhill cranes and wintering waterfowl in the region. Maintain other existing sites that will ultimately be converted to other habitat types, to the benefit of waterfowl until other habitat improvements occur.

Task: Maintain and enhance the benefits of existing grazed pasture and agricultural areas through continued cooperative lease arrangements and enhanced activity by WDFW by:
1) Fertilizing 200 acres of pasture annually,
2) Enhance weed control efforts
3) Plant 50 acres of understory crops annually
4) Annually plant 100 acres of fall grain crops.

Task: Maintain a diverse and palatable grass/legume mixture in green pasture areas by over-seeding or replanting a minimum of 50 acres annually.

Task: Consider a cooperative agreement with the neighboring landowner to establish and maintain approximately 150 acres of upland forage areas within the Vancouver/Clark Parks Unit for wintering Canada geese by the end of FY 2007.

Task: In areas where, or at such time, grazing or farming becomes infeasible; maintain green forage availability through the use of mowing and fertilizing. Attempt to develop a hay cutting contract program to reduce costs.

Task: Where practical or necessary, utilize agricultural crops as a means of "cleaning up" green pasture areas to be replanted. i.e. rotational food plots.

2. Maintain, improve and restore desired habitats in specific areas including herbaceous, scrub shrub and forested wetlands, riparian forest, oak and grass/shrub habitat for multiple species benefits.

Native habitats within the Shillapoo Wildlife Area and surrounding lands have been highly altered by humans. These actions included clearing of forests and draining of wetlands to make way for agricultural development. *Restoring native habitat for species diversity is a key focus for WDFW and an important issue for many members of the public.*

A. Strategy: Restore or enhance an estimated 194 acres of riparian, upland and forested wetland habitats in identified areas throughout the Shillapoo Wildlife Area by the end of FY 2008.

Task: Fence as necessary, remove undesirable nonnative brush and plant or encourage the regrowth of 20 acres of native trees and shrubs within the Lake River riparian zones and old slough channel within the North Unit by the end of FY 2007.

Task: Clear/fence as necessary and reestablish or improve riparian vegetation on five acres along the old slough channel within the New Columbia Gardens Unit by the end of FY 2007. (Contingent on acquisition)
Task: Expand and rehabilitate areas no longer suitable for Great Blue Heron nesting within a 40-acre area where trees have died and fallen. Clear brush as necessary and plant cottonwood trees by the end of FY 2007.
Task: Improve and expand an estimated 83 acres of riparian forest and shrub habitat along Buckmire Slough by removing undesirable nonnative brush and replanting native trees and shrubs by the end of FY 2008.
Task: Create Oak habitat by planting and/or maintaining trees and shrubs on the 5 acre existing site, on one new 5 acre site within the South Unit, and on the abandoned 26 acre agricultural site within the North unit by the end of 2007.
Note: The desired width and resulting acreage of the planned Lake River riparian zone has been a subject of debate. This has potential to significantly reduce the quality of adjoining areas managed for waterfowl pasture. If the acreage of the Lake River Riparian zone increases substantially due to final evaluations, the planned use of the abandoned 26-acre agricultural site may be changed to pasture or crop production in order to meet habitat needs for Sandhill cranes and Canada geese.
Task: Seek a cooperative agreement with the neighboring landowner to establish and/or maintain a minimum of 10 acres of new upland and wetland associated forest habitat on the Vancouver/Clark Parks South Vancouver Lake Area.
Task: Develop protocol for monitoring snag density in all existing forested habitats on the wildlife area with identified criteria for snag creation. Create snags as warranted, or provide artificial cavity nest sites where suitable trees for snag creation are absent.

Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible With Maintaining Healthy Fish and Wildlife Populations and Habitats.

1. Manage appropriate public use and recreation in a manner, which minimizes impacts to wildlife habitat and other sensitive resources.

Most of the Shillapoo Wildlife Area lands have been purchased fairly recently and have not yet had adequate public access sites developed. The conditions of the roadside locations where the public currently parks to access well over half of the wildlife area present safety concerns. Administrative access throughout the interior of the units is often difficult due to overgrown blackberry thickets, rutted travel routes, etc. *There is also a desire among some members of the public to have trails available for appreciative wildlife use although some others see this as a conflict with hunting.*

A. Strategy: Establish or improve four access points and an estimated eight miles of travel routes located throughout the Shillapoo Wildlife Area and develop materials for public distribution and posting by the end of FY 2008.[3]

[3] The establishment of travel routes is intended to strategically manage human disturbance away from sensitive areas and improve travel time efficiency for O&M and enhancement tasks.

Task: Establish parking area on the North unit with associated trails along dike and to the northern lakebed area by the end of FY 2008.
Task: Establish trailhead at southern end of Vancouver Lake unit and trail through a portion of the unit highlighting wetland habitat and associated wildlife benefits by the end of FY 2007.
Task: Establish a wildlife viewing and parking area on the east side of the South unit near the terminus of SR 501 and enlarge the southernmost parking access on Lower River Road. Establish route for foot travel across the unit (east to west) and interior routes to access the southern portions of the unit from the existing site. Complete by the end of FY 2008.
Task: Clear a maintenance access route linking the North and South Units, which will roughly follow existing levees. Complete by the end of FY 2007.
Task: Develop and publish a pamphlet for public distribution, with maps, that outlines history, objectives, and rules for the Wildlife Area by the end of FY 2007. Develop similar products for posting at public access points.
Task: Continue the current system of rotating area closures of dog training at different times of the year and educational signage designed to minimize disturbance caused by recreational users to both waterfowl wintering and ground nesting bird habitat.

B. Strategy: In the short term, maintain existing hunting opportunities. Work with the Wildlife Area Advisory Group and game and diversity management programs to address issues related to conflicts between different user groups including upland bird hunters, waterfowl hunters, dog trainers, and non-consumptive wildlife users. Also evaluate potential impacts to key species and habitats. Timeframe: 2006

2. Increase compliance with Wildlife Area rules, state law, and local ordinances within and in the vicinity of the Shillapoo Wildlife Area.

The Shillapoo is essentially an urban wildlife area, and its proximity to a large human population poses inherent problems. *The public has become increasingly frustrated by what they see as a lack of emphasis by law enforcement to control inappropriate and unlawful activities in the Vancouver Lowlands.* Because the manpower and resources of WDFW's enforcement division are limited and must be spread over a large area and multiple priorities increased coordination with other agencies may be necessary to protect not only the wildlife area but Port of Vancouver, Regional Park, and private lands in the area. Continued implementation of other measures to discourage inappropriate uses will also be necessary.

A. Strategy: Communicate problem areas, specific violations, and areas of concern to WDFW enforcement personnel as they are detected.
B. Strategy: Improve and maintain signage concerning area rules and maintain access sites in an attractive condition. Timeframe: Ongoing
C. Strategy: Develop recommendations for areas within the wildlife area that should be closed to target practice and submit for agency approval.
D. Strategy: Maintain existing vehicle barriers to protect habitat and capitol features from damage due to off road vehicle driving. Monitor for off road traffic and place additional barriers as needed. Timeframe: Ongoing

E. Strategy: Coordinate with other state and local law enforcement agencies and identify appropriate measures that can be implemented collectively in the area. Consider sponsoring a forum involving law enforcement agencies and the Wildlife Area Advisory Group. Timeframe: Ongoing

Agency Objective: Provide Sound Operational Management of WDFW Lands, facilities and access sites.

1. Reduce the levels of noxious weeds and other undesirable plants that limit habitat quality.

The altered landscape in this area and its close proximity to an industrial and human population center has contributed to the proliferation of exotic weeds both in the wildlife area and the general vicinity. *Reducing noxious weeds is perhaps the most important public issue relating to this wildlife area. Comments concerning Himalayan blackberry are probably the number one complaint we receive from the public.*

A. Strategy: Initiate control of Himalayan blackberry throughout the Shillapoo Wildlife Area on a minimum of 500 feet of linear occurrences (fence lines etc.) and a minimum of 50 acres where dense stands limit habitat quality annually beginning in areas where they detract from the quality of wintering waterfowl habitat. Timeframe: 2006. Example: A fifty-acre waterfowl pasture with smaller acreage of blackberry within it, limiting sight distance and thus waterfowl use.

Task: Prioritize areas for treatment, and begin mowing, spraying, and/or physical removal of blackberry thickets annually.

B. Strategy: Annually initiate enhanced level control activities for Canada thistle and other undesirable herbaceous weeds in 200 acres of pasture and grassland areas beginning in those areas managed as waterfowl wintering habitat. Conduct follow up maintenance activities as required.

Task: Spray, or provide materials to lessees, for control work in identified areas.

Task: Mow infested areas, where possible, to prevent seed spread into other areas.

Task: Introduce biological control agents, if available, in areas where other control mechanisms are ineffective or impractical.

C. Strategy: Reduce the number of major occurrences (Dense stands >200 square feet) of poison hemlock by 75% throughout the Shillapoo Wildlife Area by the end of FY 2007.

Task: Survey, Identify, Map and conduct control efforts throughout the wildlife area. Document survey and control efforts.

D. Strategy: Continue an aggressive control and monitoring program on an estimated 200 acres of known purple loosestrife infestations. Timeframe: Annually

Task: Conduct appropriate control measures to include mowing, spraying, physical removal or other measures, which may include the release of biological controls.

Task: Conduct systematic annual surveys of all moist soil sites within the wildlife area to prevent future infestations. Document survey and control efforts.

E. *Strategy: Communicate with local weed management agency to keep abreast of new problem weeds in the area. Monitor for new weed infestations and begin control measures as the need arises. Timeframe: Ongoing*

2: Develop and/or maintain the infrastructure necessary for effective management of the Shillapoo Wildlife Area and conduct maintenance activities, as required, throughout the site.

For the past decade a lack of equipment suitable for effective management has severely hampered progress toward habitat goals. There has also been no facility to operate from other than the regional office where storage space and work areas are cramped. Funding for key equipment purchases have been secured through mitigation funds as well as partial funding for an operations site. The needs for operational space may be met at a new regional office site that is currently being planned.

A. Strategy: Lease, purchase or construct an operational facility adequate to accommodate project equipment, supplies and activities and secure equipment necessary to complete designated tasks.

B. Strategy: Maintain or operate water control devices, pumps, fences, roads, signs and other structures and control weeds as needed throughout the wildlife area. Timeframe: Year-around

CHAPTER 4. PERFORMANCE MEASURES, EVALUATION AND UPDATES TO THE SHILLAPOO WILDLIFE AREA PLAN

Performance measures for the Shillapoo Wildlife Area Plan are listed below. Accomplishments and progress toward desired outcomes will be monitored and evaluated to produce an annual performance report each calendar year. The plan will be considered a working document that will evolve as habitat and species conditions change, as new regulations are enacted, and as public issues and concerns change. Updates will be considered annually and added to the plan as needed.

1. Performance measures for the Shillapoo Wildlife Area in 2006 include:

1) Restoration, enhancement or improved management of approximately 1300 acres of wetlands to provide habitat for migratory waterfowl and Sandhill cranes.
2) Improved management of 950 acres of uplands for migratory waterfowl and Sandhill cranes and maintenance of other crop areas until they are restored to native-type habitats.
3) Restoration or enhancement of 108 acres of riparian forest-type habitat.
4) 40 acres of forested wetland habitat rehabilitated as potential future great blue heron nesting habitat.
5) Reestablishing a minimum of 10 acres of oak forest habitat.
6) Improved coordination and management with adjoining areas dedicated to wildlife habitat management.
7) A substantial reduction in noxious weeds, Himalayan blackberry and other plants that negatively influence wildlife habitat quality for target species.
8) Increased monitoring for, early detection and control of new invasions of exotic weeds.
9) Improved access for appropriate public use and information about the area that is readily available to the public.
10) Implementation of measures that protect habitat and other features from damage due to vandalism and other unlawful acts.

APPENDIX 1. PUBLIC ISSUES

Citizens Advisory Group (CAG) and District Team (DT) Issues and Concerns
The purpose of meeting with the CAG and DT was to obtain input to help guide management actions on the wildlife area. A draft of the introduction and history of the wildlife area, goals and objectives from previous plans and copies of the Agency's goals and objectives were distributed for review and discussion. Below is a list of issues and concerns identified by the CAG and DT (District Team recommendations are underlined). This input will assist in developing strategies to implement management goals and objectives.

Issue A. Access/Recreation

- Improve Parking
- Maintain hunting opportunities on the wildlife area
- Canal bridge crossings
- Provide more "stiles" or other fence crossings
- Improve hunting blinds and possibly provide more where appropriate
- Provide maps and post "hunting etiquette" guidelines
- Do not allow target shooting during hunting season (current practice)
- Increase wildlife viewing opportunities and information
- Continue pheasant release program
- Address conflict between hunters and bird watchers (comment was to exclude non-hunters during seasons)
- Continue to provide but limit trap shooting
- Need another site for trap shooting that could be open year-round

Issue B. Habitat Management

- Control Himalayan Blackberry
- Control Canada thistle and other noxious weeds
- Increased/late crop plantings for geese
- Identify measurable goals for wetland vegetation
- Protect existing oak stands as well as developing new oak habitat
- Consider use of conifers in riparian areas
- Consider excavating Canary grass to remove from wetlands

Issue C. Wildlife Area Management

- Emphasize partnerships in planning, acquisition, recreation and restoration projects.
- Remove unnecessary fences
- Consider WDFW taking over Reiger Hwy. (speed bumps, parking, barriers)
- Increase surveillance for new weeds
- Develop a "Needs and Wants List" where help is needed
- Provide better public outreach and information
- "Friends of Shillapoo" group
- Explore quality hunting ideas (closed days, limited entry)
- Provide adequate screening and other measures, where needed, to protect fish.
- Continue management practices that benefit Sandhill Cranes (agriculture, development of shallow wetlands.)

- Potential area for Western Pond Turtle reintroduction
- Prohibit public use in goose wintering areas after hunting season through April 15
- Close nesting areas to public access during nesting season

Issue D. Enforcement

- Unlawful and inappropriate activities need to be controlled (Emphasize Reiger Hwy.)
- Enforcement in the vicinity needs to improve—work with County/City

APPENDIX 2. WEED CONTROL PLAN

Weed Control Goals on WDFW Lands
The goal of weed control on Department lands is to maintain and improve habitat for wildlife, meet legal obligations, provide good stewardship and protect adjacent private lands.

Weed control activities and restoration projects that protect and enhance fish and wildlife populations and their habitats on Department lands are a high priority. When managing for specific wildlife species on our lands the weed densities that trigger control are sometimes different than on lands managed for other purposes (e.g. agricultural, etc.). For example, if a weed is present at low densities and does not diminish the overall habitat value, nor pose an immediate threat to adjacent lands, control may not be warranted. WDFW focuses land management activities on the desired plant species and communities, rather than on simply eliminating weeds.

Control for certain, listed species is mandated by state law (RCW 17.10 and 17.26) and enforced by the County Noxious Weed Board. WDFW will strive to meet its legal obligation to control for noxious weeds listed according to state law (Class A, B-Designate, and county listed weeds).

Importantly, WDFW will continue to be a good neighbor and partner regarding weed control issues on adjacent lands. Weeds do not respect property boundaries. The agency believes the best way to gain long-term control is to work cooperatively on a regional scale. As funding and mutual management objectives allow, WDFW will find solutions to collective weed control problems.

Weed Management Approach
State law (RCW 17.15) requires that WDFW use integrated pest management (IPM), defined as a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives, to accomplish weed control. The elements of IPM include:

Prevention- Prevention programs are implemented to keep the management area free of species that are not yet established but which are known to be pests elsewhere in the area.

Monitoring- Monitoring is necessary to implement prevention and to document the weed species, the distribution and the relative density on the management area.

Prioritizing- Prioritizing weed control is based on many factors such as monitoring data, the invasiveness of the species, management objectives for the infested area, the value of invaded habitat, the feasibility of control, the legal status of the weed, past control efforts, and available budget.

Treatment- Treatment of weeds using biological, cultural, mechanical, and chemical control serves to eradicate pioneering infestations, reduce established weed populations below densities that impact management objectives for the site, or otherwise diminish their impacts. The method used for control considers human health, ecological impact, feasibility, and cost-effectiveness.

Adaptive Management- Adaptive management evaluates the effects and efficacy of weed treatments and makes adjustments to improve the desired outcome for the management area. The premise behind a weed management plan is that a structured, logical approach to weed management, based on the best available information, is cheaper and more effective than an ad-hoc approach where one only deals with weed problems as they arise.

Weed Species of Concern on the Shillapoo WLA

Weeds of concern on Shillapoo WLA include Canada thistle (*Cirsium arvense*), Himalayan blackberry (*Rubus procerus*), poison hemlock (*Conium maculatum*), reed canary grass (*Phalaris arundinacea*), Purple loosestrife (*Lythrum salicaria*), Scotch broom (*Cytisus scoparius*), Japanese Knotweed (*Polygonum cuspidatum*), and English ivy (*Hedera helix).* This list is based on species that have been documented on the wildlife area (Table 1).

Table 1. Shillapoo Wildlife Area weeds including the state and county weed class listing and acres treated.

B-

Weed Species	2005 State Weed Class	2005 County Weed Class	Wildlife Area Unit(s)	2005 Treated Acres
Canada thistle	C	C	all	590
Himalayan Blackberry	Not listed	Not listed	all	100
Poison Hemlock	C	B	all	27.5
Reed Canary Grass	C	C	all	100
Purple Loosestrife	B	B	all	120
Scotch broom	B	B	all	Few plants
Japanese Knotweed	B	B	South	0
English Ivy	C	B	Vancouver	1 plant

Designate are state-listed and mandatory for control to prevent seed production/spread.

Management for individual weed species can be found in the following "Weed Species Control Plan" (WSCP) sections.

CANADA THISTLE WEED SPECIES CONTROL PLAN

Latin name: *Cirsium arvense* **Common name**: Canada thistle
Updated: 2006

DESCRIPTION: Canada thistle (*Cirsium arvense*) is an aggressive, creeping perennial weed that infests crops, pastures, rangeland, roadsides and noncrop areas. Infestations start on disturbed ground, including ditch banks, overgrazed pastures, tilled fields or abandoned sites. Canada thistle grows in a variety of soils and can tolerate up to 2 percent salt content. It is most competitive in deep, well-aerated, cool soils. It usually occurs in 17- to 35-inch annual precipitation zones or where soil moisture is adequate. It is less common in light, dry soils. Canada thistle develops from seed or vegetative buds in its root system. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Canada thistle begins to flower in late spring to early summer in response to 14- to 16-hour days. Plants are male or female and grow in circular patches that often are one clone and sex. Female flowers produce a sweet odor and insects readily pollinate different sexed patches up to 200 feet apart. Canada thistle may produce 1,000 to 1,500 seeds per flowering shoot. Generally, vegetative reproduction from its root system contributes to local spread and seed to long distance dispersal. Seed can remain viable in the soil for up to 20 years.

MANAGEMENT INFORMATION:
Grasses and alfalfa can compete effectively with Canada thistle. Herbicides such as Tordon 22K (picloram), Curtail (clopyralid plus 2,4-D), Transline (clopyralid), Banvel/Vanquish/Clarity (dicamba), 2,4-D and Telar (chlorsulfuron) are effective against Canada thistle. These herbicides are most effective when combined with cultural and/or mechanical control. Mowing can be an effective tool if combined with herbicide treatments. Mowing alone is not effective unless conducted at one-month intervals over several growing seasons. *Ceutorhyncus litura*, *Rhinocyllus conicus* and *Urophora cardui* are biocontrol insects used for Canada thistle. Ceutorhyncus alone will not effectively control Canada thistle. It must be combined with other methods to be successful.

CURRENT DISTRIBUTION ON THE SITE
Canada thistle is located throughout the wildlife area from high to low densities.

ACRES AFFECTED BY WEED: 1,600 **WEED DENSITY:** Low to high

GOALS
- Monitor plants when found for bio controls at effective levels. Control stands where bio controls are not evident to prevent seed production.
- Prevent new occurrences

OBJECTIVES
- Monitor effectiveness of existing biological controls, which appear to have been effective in controlling seed production in the wildlife area and surrounding lands.
- Implement control measures at sites where biological controls do not appear to be present.
- Mowing plants before seed production and dispersal occurs.
- Spray plants when or where mowing is not effective or feasible.

ACTIONS PLANNED
In 2006, monitor plants as they begin to bud. If present, insects should be easily observable around the top of the plant. If not present use mechanical and/or chemical methods to prevent seed production and dispersal.

CONTROL SUMMARY AND TREND
2000-260 acres mowed and/or sprayed
2001-685 acres mowed and/or sprayed, Stem gall flies introduced
2002-838 acres mowed and/or sprayed
2003-680 acres mowed and/or sprayed
2004-830 acres mowed and/or sprayed
2005-590 acres mowed and/or sprayed

Canada thistle has been a concern on this site. Biological controls have limited the spread of the plant. However, biological controls are not eliminating the plants from the area, so mechanical and chemical methods will continue to be implemented to control Canada thistle in the area. When agricultural practices such as disking and plowing are used, conditions become favorable for the spread of this plant. Bare ground often encourages the infestation of Canada thistle where it can out compete other vegetation. Therefore bare ground is replanted as soon as possible to stop the spread.

HIMALAYAN BLACKBERRY WEED SPECIES CONTROL PLAN

Scientific Name: *Rubus discolor/armeniacus* **Common Name**: Himalayan blackberry
Updated: 2006

DESCRIPTION: Himalayan blackberry (*Rubus discolor/armeniacus*) is a robust, sprawling perennial, more or less evergreen, shrub. Leaves are large, round to oblong and toothed, and usually in groups of five. Stout, thick, arching stems (canes) have large, stiff thorns. Shrubs first appear as individual canes, then groups of canes, gradually increasing to become great mounds or banks, with individual canes reaching up to nine feet. The main cane grows up to 15 feet tall; trailing canes spread up to 20-40 feet, frequently taking root at the tips. Small white to pink flowers appear in spring and then roundish, black edible fruits form in mid-summer to early August. Individual canes live only two to three years, yet reach a density of 525 canes per square yard. Roots penetrate down about 3 feet, and can be 30 feet long. Himalayan blackberry also grows vegetatively by root and stem fragments. Seeds remain viable for several years.

Native to Western Europe, this weed was probably first introduced to North America in 1885 as a cultivated crop. By 1945 it had naturalized along the West Coast. Himalayan blackberry tolerates a wide range of soils and moisture conditions, but not true wetland soils. It prefers full sun and well-drained soils. It is found in vacant lands, pastures, open forests, tree farms, roadsides, creek gullies, riparian areas, fence lines and right-of-way corridors.

Once it becomes well established, Himalayan blackberry out competes any low growing native vegetation and can prevent shade intolerant trees from growing, leading to permanent thickets with little other vegetation present. These dense, impenetrable thickets limit the movement of large animals. When this species takes over entire stream channels and banks, it can increase the possibility of flooding and erosion.

MANAGEMENT INFORMATION:
Control is best done in two phases: 1) remove above ground vegetation, and 2) kill/remove root crowns and major side roots (not necessarily in that order).

Biological: The USDA has not supported the introduction of herbivorous insects to control Himalayan blackberry due to the risk these insects may pose to commercially important Rubus species. Research on this subject continues.

Chemical: Herbicides such as triclopyr (Garlon 3a and 4), glyphosate (Roundup, Rodeo) or 2,4-D with triclopyr (Crossbow) deliver effective control when applied to mature, uncut canes in late summer/fall or to cut/resprouted stems in fall. All standing, dry, hard canes need to be removed for effective restoration.

Manual: Removing root crowns and major side roots by hand digging (claw mattock, pulaski/mattock) is a slow but sure way to destroy blackberry (especially small patches). You must be thorough and follow up because large root fragments left in soil may produce a new plant. Starting with lesser weed infestations and working towards the worst stands is effective at maximizing self-recovery of native vegetation. Or immediately seed with native grasses to reduce invasion by other weeds and allow follow-up treatment of surviving Himalayan blackberry with

broadleaf killing herbicides (if desired). Remove canes and fragments to prevent resprouting. Although fire alone doesn't control this weed, burning large infested areas will remove standing mature plants after a pre-spray of herbicide(s) to kill and desiccate aboveground portions. Planting fast-growing shrubs or trees or shade tolerant species may reduce or prevent Himalayan blackberry re-establishment, since the species is usually intolerant of shade. Grazing sheep and goats where mature plants have been removed has also controlled regrowth, but both are non-selective eaters.

Mechanical: Mowing and cutting can be very effective in controlling Himalayan blackberry. Several cuttings are required before the underground parts exhaust their reserve food supply. If only a single cutting can be made, do it when plants begin to flower. Debris may be fed through a mechanical chipper and used as mulch. Need to follow-up the next year, as Himalayan blackberry may resprout from root crowns in greater density (and overtop any planted vegetation).

CURRENT DISTRIBUTION ON THE SITE
Himalayan blackberry is located throughout the wildlife area. Sites vary from single plants to large extensive thickets.

ACRES AFFECTED BY WEED: approximately 1000 acres **WEED DENSITY:** Low to high

GOALS
- Monitor for increases in distribution.
- Continue to control plants when located incidental to other work.
- Prevent new occurrences
- Use mechanical methods for control
- Use of chemical methods to control or eradicate infected areas or stands

OBJECTIVES
- Spray plants when encountered during other weed control work.
- Cut or pull plants when encountered.
- Mechanically remove plants with tractors, mowers, and brushcutters.
- Spray plants as a follow up where mechanical methods are not feasible.

ACTIONS PLANNED
In 2006, conduct control concurrent with other work. Mowing and spraying of plants is planned particularly in areas where waterfowl management is emphasized and riparian enhancements are planned.

CONTROL SUMMARY AND TREND
2000-2.5 acres cut or sprayed
2001-6.75 acres cut or sprayed
2002-12.5 acres cut or sprayed
2003-5.5 acres cut or sprayed
2004-25 acres cut or sprayed
2005-100 acres cut or sprayed

Himalayan blackberry has been a major concern to date on this site. Grazing by cattle has probably helped to limit the plants spread in areas where cattle are being grazed, but not all areas are open to grazing and large stands do not seem to be effected by cattle grazing. Mowing as helped to stop large stands from establishing, but has not stopped regrowth of the plants. Continuous maintenance is needed on a site to prevent the development of large stands. Large stands and thickets are either sprayed or contracted brush clearers are hired to remove these stands.

Due to recent increases in control efforts, Himalayan blackberry is on a decreasing trend however continued efforts will be necessary over a period of years to fully bring the weed under control.

POISON HEMLOCK WEED SPECIES CONTROL PLAN

Latin name: *Conium maculatum* **Common name**: Poison Hemlock
Updated: 2006

DESCRIPTION: Poison hemlock (*Conium maculatum*) is native to Europe. It contains highly poisonous alkaloids toxic to all classes of livestock and humans. It has poisoned many who have mistaken it for parsley. Poison hemlock is often found on poorly drained soils, particularly near streams, ditches, and other surface water. Poison hemlock is a biennial that grows up to 10 feet tall. Stems are stout, hollow, ridged, and mottled with purple spots. Leaves are shiny green, 3 to 4 times pinnately compound, and clasp the stem at the obvious nodes. Crushed foliage has a disagreeable odor. Flowers are small, white, and borne in umbrella-shaped clusters about 3 inches across in early summer. Seeds are ridged and flattened, with 2 seeds borne together. The plant has a thick, white taproot.

MANAGEMENT INFORMATION:
A biological control agent (a defoliating moth) provides good to excellent but inconsistent control. The herbicide 2,4-D applied to the early stages of growth will kill it. Poison hemlock must be removed. It cannot be allowed to go to seed. Gloves must be worn when handling it. It cannot be composted. Dead stalks can remain poisonous for two or three seasons.

CURRENT DISTRIBUTION ON THE SITE
Poison Hemlock is located throughout the wildlife area on all of the units. On the Vancouver Lake unit only one small stand is known of and is monitored and sprayed as needed. The North and South units have scattered infestations ranging from a single plant to an area of a tenth of an acre.

ACRES AFFECTED BY WEED: Not determined, scattered sites throughout the wildlife area.

WEED DENSITY: Low to moderate

GOALS
- Control expanding populations
- Prevent new occurrences
- Eliminate all major stands

OBJECTIVES
- Survey and map existing populations
- Spray or mow all plants before going to seed
- Overseed areas where the plant has been removed to prevent new occurrences

ACTIONS PLANNED
Due to the plant being highly poisonous, chemical and mechanical control will be used on the wildlife area to control and stop the spread of the plant. New infestations occur regularly and due to the large seed bank of established stands repeated spraying and monitoring is needed to eliminate the plant from a site. Known sites that are affected are monitored and sprayed every year, and then replanted with a pasture mix to compete with the poison hemlock in order to try to take up the existing ground space. Other sites on the wildlife area are surveyed and monitored to determine if

any new infestations have occurred, and new infestations are controlled as soon as possible to eliminate the spread of the plant to other areas.

CONTROL SUMMARY AND TREND

2000-9.5 acres sprayed
2001-8 acres sprayed
2002-2 acres sprayed
2003-11 acres sprayed
2004-9 acres sprayed
2005-27 acres sprayed

New infestations occur regularly on the wildlife area so continuous monitoring is needed to stop the spread of poison hemlock. Although new infestations can occur and the distribution of the plant is spreading, the overall number of plants and the size of the affected sites are decreasing.

REED CANARYGRASS CONTROL PLAN

Latin Name: *Phalaris arundinacea* **Common Name**: Reed canarygrass
Updated: 2006

DESCRIPTION: Reed canarygrass is a perennial grass that can grow three to six feet tall. The sturdy, often hollow stems can be up to 1/2 inch in diameter, with some reddish coloration near the top. Leaf blades are flat and hairless, 1/4 to 3/4 of an inch wide. In June and July flowers are borne on the top three to six inches of a stalk that is held high above the leaves. Reed canarygrass can spread by seeds or creeping rhizomes (roots that sprout shoots) and will also produce roots and shoots from the nodes of freshly cut stems. However, it is shallow-rooted—only two to eight inches deep.

Habitat: While possibly native to North America, it is very likely that the reed canarygrass found in wet places today is a European cultivar specifically bred for its growth and vigor, and widely introduced starting in the 1900s. In some areas, this grass has also been used for erosion control. A wetland plant, this species typically occurs in soils that are saturated or nearly saturated for most of the growing season. Established stands can tolerate extended periods of inundation. It does not survive in deep shade or dry uplands, but can tolerate prolonged drought.

Threat: Reed canarygrass is extremely aggressive and often forms persistent monocultures in wetlands and along rivers and streams. Infestations threaten the diversity of these areas, since the plant chokes out native plants and grows too densely to provide adequate cover for small mammals and waterfowl. The grass can also lead to increased siltation along drainage ditches and streams. Once established, reed canarygrass is difficult to control because it spreads rapidly by rhizomes.

MANAGEMENT INFORMATION:
Biological: There are no known biological control agents for reed canarygrass.

Chemical: Glyphosate (Rodeo, Aquamaster, Glypro), amitrol, dalapon, and paraquat have all been tried with some success. Mowing plants down to 3 feet or less and then spraying at flowering time (late summer to early fall) produced effective control. Only glyphosate (Rodeo) is licensed for use in aquatic systems in Washington. Applying Rodeo, followed in two to three weeks by prescribed burning has also been effective. Sethoxydim (Vantage) is a grass-specific herbicide used with some success in the Pacific Northwest, but not labeled for aquatic use.

Manual: The following covering/mulching techniques can eliminate reed canarygrass: using a thick woven geotextile shade cloth, applying several layers of cardboard covered by 4-6 inches of wood mulch, using a thick woven plastic fabric (Mirafi or Amoco brands) held in place by 7-inch gutter spikes, washers and duck-bill tree anchors, or even rubber, road felt and other thick materials that keep out light. Keep the covering firmly in place for over one year (over an entire growing season), even under water, to kill all plants. Re-vegetation or reseeding is generally necessary. Mowing plants close to the ground prior to applying any covering greatly helps. Flooding an area with more than 5 feet of water for at least three growing seasons has successfully eliminated this weed. While burning generally does not kill mature canarygrass, prescribed fire can be a pretreatment to tillage, shade cloth, or herbicide application with good results, since fire will remove dead litter and standing vegetation. Planting native trees and shrubs in weed-infested

circles or blocks (that have been killed by herbicide) can produce shade and weaken the vigor and growth of adjacent reed canarygrass patches over time. Seeding an area with competitive grass species, such as tufted hairgrass (*Deschampsia cepitosa*), slough grass (*Beckmannia syzichachne*), bentgrass (*Agrostis spp*.) or turf-forming varieties of red fescue (*Festuca rubra*), may prevent significant establishment of canarygrass seeds.

Mechanical: Multiple mowings a year (early to mid-June and early October) may be a valuable control method, since it removes seed heads before they mature and exposes the ground to light, which promotes the growth of native plant species. Cutting, disking or plowing as the plants are coming into flower can also control this weed.

CURRENT DISTRIBUTION

Reed canarygrass is widely distributed, primarily in wetlands and some pastures, throughout Shillapoo Wildlife Area. It can be found in all of the units in stands ranging in size and density from a few small clusters to dozens of affected acres.

Acres Affected: Approximately 800 Weed Density: Low to high

Objectives

- Control expanding populations
- Prevent new occurrences
- Reestablish native plants

Actions planned

- Mow stands before seeding occurs
- Treat infestations prior to habitat restoration plantings
- Flood areas if possible to drown out the grass and allow native vegetation to return
- Create new water holding structures to drown the grass.

CONTROL SUMMARY AND TREND

Control of Reed Canary Grass generally has not been tracked in terms of acres largely because traditional weed control measures have not been employed on this wildlife area. Several wetland enhancement basins, which have become operational within the past few years have resulted in control of this plant and reestablishment of native vegetation.

Mowing will continue to help stop the grass from going to seed and infesting new areas and make it usable by wintering waterfowl. Infested areas will continue to be flooded if possible to drown the grass, and new projects are being created to build new sites that can be flooded to control or eradicate canary grass from the area to allow native vegetation to return. Disking will be used on a rotating basis in sites where water management is possible to expose and dry the canary grass roots and facilitate the germination of native plants.

The trend is static or slightly decreasing, but the spread has seemed to decline over recent years as new water holding structures, ponds, and pumping facilities for flooding areas have been created.

PURPLE LOOSESTRIFE CONTROL PLAN

Latin Name: *Lythrum salicaria* **Common Name**: Purple loosestrife
Update: 2006

DESCRIPTION: Purple loosestrife is a perennial, emergent aquatic plant with a woody taproot, often growing six to ten feet tall and five feet wide. The narrow oblong leaves are 1.5 to four inches long, smooth, and opposite or whorled. Magenta flowers appear from July to early October on long, showy spikes. Each mature plant can produce 2.7 million pepper-sized seeds that can remain in the soil for years. Most seeds germinate in high densities (about 1,000 to 2,000/sq. foot) around the parent plant and flower eight to ten weeks later. Purple loosestrife also spreads vegetatively, thanks to substantial root wads with buds that can become shoots or roots.

Habitat: Probably Europe and Asia. During the mid 1900's the nursery industry developed and sold plants thought to be sterile. Of the 12 species in the continental U.S., three are exotic (introduced). Purple loosestrife occurs in freshwater and brackish wetlands, cattail marshes, sedge meadows, open bogs, ditches and other wet disturbed soil areas, and along lakes, streams and rivers. It tolerates a broad pH range (4.0 and 9.1) and grows best in high organic soils, but tolerates clay, sand, muck and silt. Generally found in full sun, it can survive in half shade.

Threat: With its ability to produce prolific amounts of seeds and spread vegetatively from root buds and stem pieces, this species is highly invasive, competitive and long-lived (up to 20 years). It is an extremely successful and sudden invader of disturbed wetlands due to its massive seed bank, outcompeting all native seedlings and severely altering wetland ecosystems. It displaces native plants; nesting and feeding habitat for waterfowl, fur-bearing animals and other bird populations; reduces recreational hunting and trapping grounds; and decreases land values. Purple loosestrife also invades and clogs irrigation systems (costing millions annually to fix) and overtakes wild meadows, hay meadows and wetland pastures used for grazing.

MANAGEMENT INFORMATION:
Biological: Leaf-feeding beetles (*Galerucella calmariensis* and *G. pusilla*) may provide long-term success. These beetles defoliate and attack the terminal bud area, drastically reducing seed production and leaving a high seedling mortality rate (nearly 50 percent). A root-mining weevil (*Hylobius transversovittatus*) that also eats leaves and severs xylem and phloem tissue (depleting carbohydrate reserves) greatly reduces plant size. Other possible agents include a seed-eating beetle (*Nanophyes marmoratus*) that reduces seed production by 60 percent, another (*N. brevis*) that attacks seed capsules, and a cecidomyiid fly whose galling can reduce the foliage by 75 percent and seed production by 80 percent.

Chemical: Glyphosate (AquaNeat, AquaMaster) are the herbicides labeled for aquatic use in Washington and provide good control if applied in July and August; however they are non-specific. For larger infestations where selective application of glyphosate is not practical, broadleaf herbicides (Triclopyr and 2,4-D based) are also effective, if applied in late May to early June. A combination of 2,4-D and dicamba (1:1 tank mix) has been used on a limited basis in western irrigation ditches. Spray loosestrife at 10-15 percent of its mature growth for good results and repeat once during the growing season.

Manual: Flooding plants for five weeks can produce 100 percent mortality, but all growth must be underwater. This is only recommended for large infestations because of problems maintaining constant water levels and harm to native plants. If possible, delay drawdown until mid-July, after growing season has peaked. Mature flowering stems of small infestations can be cut at the base in late summer or early fall, bagged and disposed of to prevent seed production. Black plastic covering is an interim option for dense seedling infestations, slowing growth and seed production. However, root crowns did die in plots where heavy litter from mowing remained covered until the next June. Replacement seeding may be useful to control or contain loosestrife populations on buffer property. Trials with Japanese millet (*Echinochloa frumentacea*) and smartweed (*Polygonum lapathifolium*) sown immediately after marsh drawdown successfully outcompeted loosestrife seedlings. However, the millet didn't regenerate well and has to be replanted every year. The following spring loosestrife grew first due to its over-wintering rootstock.

Mechanical: While mowing alone is not a viable control option, doing so late in the season reduces shoot production more than mid summer cutting. Where disturbance to soil and plants is acceptable, tilling the top six inches of soil with disc or harrow can effectively grub out the root crown where the plant's energy is stored.

CURRENT DISTRIBUTION
Infestations of purple loosestrife are located on the Vancouver Lake unit along Vancouver Lake, and on the North and South Units where they meet in the Shillapoo Lakebed. Plants are scatted on both sites.

ACRES AFFECTED: Approximately 200 acres **WEED DENSITY:** Low to moderate

GOALS:
- Control expanding populations
- Prevent new occurrences

Objectives
- Survey and map existing and treated populations
- Calculate the acres affected
- Treat all infestations
- Survey nearby areas for pioneering infestations

ACTIONS PLANNED
In 2006, all affected and neighboring sites will be monitored and surveyed to determine the extent of the infestation. Spot spraying and/or removal of the plant, or seed heads will be conducted to manage the spread of purple loosestrife.

CONTROL SUMMARY AND TREND
2000-100 acres spot spray or dig plants
2001-120 acres pulled or cut individual plants
2002-10 acres cut and biologicals introduced
2003-10 acres cut or pulled
2004-100 acres pulled or cut
2005-120 acres pulled, cut and/or spot sprayed

Purple loosestrife appears to be on an increasing trend particularly in the North Unit. This is of particular concern as this is an area planned for extensive wetland restoration and enhancement. An increased emphasis is being placed on controlling the plant.

SCOTCH BROOM WEED SPECIES CONTROL PLAN

Latin name: *Cytisus scoparius* **Common name:** Scotch or Scot's Broom
Updated: 2006

DESCRIPTION: Scotch broom is native to Europe and was likely introduced as an ornamental. It spreads by seed and inhabits well-drained sites over a wide range of precipitation regimes. Several commercial varieties of Scotch broom are not considered noxious. Scotch broom is a woody perennial species up to 10 feet tall. Leaves are mostly trifoliate with ½ inch long, alfalfa-like leaflets. Stems are strongly angled and dark green, with branches that spread only slightly from the main stem. Flowers are bright yellow, pea like, 1 inch in length, and borne in the leaf axils during June. Brown seedpods are smooth, except for hair along the margins, flattened, and contain several beanlike seeds, which are thrown some distance as the pods snap open at maturity. Like many other legumes, Scotch broom forms root nodules with soil bacteria to fix nitrogen. Scotch broom is widespread along both coasts and has been introduced in northern Idaho primarily. It grows best in open prairies, meadows, scrublands, and roadsides.

MANAGEMENT INFORMATION:
Hand pulling using weed wrenches can be effective if the infestation is small enough. Soil disturbance as a result of hand pulling increase the chance of reinfestations. Mowing of Scotch broom is most effective during the late summer months when the plants are most stressed. When mowed, Scotch broom plants with smaller stem diameters are more likely to resprout than plants with larger diameters. There are several biological controls available for Scotch broom. *Leucoptera spartifoliella*, a twig-mining moth reduces the vigor of the Scotch broom but will not usually kill them. *Apion fuscirostre* is a seed feeding weevil that eats the seeds and are then released when the seedpod pops open. *Agonopterix nervosa* is a shoot tip leaf-tying moth, but has little effect in controlling Scotch broom. Herbicides such as triclopyr ester (Garlon 4), triclopyr amine (Garlon 3A), triclopyr and 2,4-D low volatile ester (Crossbow), and glyphosate (Roundup) all can be used to control Scotch broom. Late summer burning has been shown to be somewhat effective against Scotch broom.

CURRENT DISTRIBUTION ON THE SITE
Scotch broom is in very low densities on the wildlife area, meaning that there are no large stands and possibly only a few single plants scattered across the area, but encroachment from the surrounding areas is a major concern.

ACRES AFFECTED BY WEED: Very limited **WEED DENSITY**: Very Low

GOALS
- Control scattered plants
- Control expanding populations
- Prevent new occurrences

OBJECTIVES
- Monitor changes in plant density due to control efforts or weed spread
- Continue herbicide applications by ground
- Continue pulling and cutting in sensitive areas

ACTIONS PLANNED
Pulling will be the primary method of control for Scotch broom. In areas where the infestation is sparse or small this will be done primarily using weed wrenches, ATV's, or tractors. If a large stand is found in a non-sensitive area spraying will be employed as an option. Larger plants that cannot be pulled will either be sprayed or cut.

CONTROL SUMMARY AND TREND
To date only a few plants have been found on the wildlife area, which were pulled when discovered.

Scotch broom is on an increasing trend on adjacent lands around portions of the wildlife area. It has been increasing on areas east of the wildlife area along State Highway 501. Preventing the establishment of a population on the wildlife area is a top priority. Plants adjacent to the area are pulled to prevent an infestation. However not all plants are pulled due to access restrictions, so stopping the spread of Scotch Broom onto the wildlife area is a priority. Established plants are on Clark County Parks and Recreation (CCPR) property, and WDFW employees have pulled plants bordering the road separating the wildlife

APPENDIX 3. FIRE CONTROL PLAN

Responsible Fire-Suppression Entities: The Shillapoo Wildlife Area primarily falls within the jurisdiction of the Vancouver Fire District and the Clark County Fire District #6. The Vancouver Fire district would respond to any fire in the Vancouver Lake Unit, those in the western part of the North Unit, and all fires in the South Unit, except those in the extreme northeast corner beyond NW Erwin O. Reiger Memorial Highway. Clark County Fire District #6 would respond to any fire located in the eastern section of the North Unit and in the extreme northeast portion of the South Unit. DNR may be responsible for any fires on "unimproved lands" within the wildlife area.

Fires that occur within the LFD's are the responsibility of the LFD's and fires that occur within the state fire protection boundary are the responsibility of the DNR if on unimproved lands. Improved lands include pastures and agricultural sites. Therefore, depending upon where the fire occurs, the appropriate entity must be contacted first, followed by an immediate call to other jurisdictions adjacent to the fire. In some cases, where there are multiple landowners or fire responders, fire suppression activities may involve two or more fire fighting entities.

Department Fire Management Policy: It is the Departments policy that wildlife area staffs are not firefighters and should not fight fires. Wildlife Area staff are trained in fire fighting and fire behavior, however, staff will only provide logistical support and information regarding critical habitat values to the Incident Commander of the responding fire entity.

Wildlife Habitat Concerns: The Shillapoo Wildlife Area is critical to providing winter habitat to migrating and wintering waterfowl. Large-scale fire in the forage areas could have a serious negative impact on forage available to the wintering flocks during the winter months. Fire could also create conditions that may facilitate the expansion of some weeds on the site.

Sensitive habitats are also present including wetlands and riparian vegetation. Some fire fighting techniques and equipment can damage these areas if care is not taken. Due to this concern, WDFW requests that the Incident Commander or other fire fighting personnel on site notify WDFW personnel immediately in the order listed below. A WDFW Advisor will provide information to the Incident Commander regarding habitat concerns.

Some locations on the Shillapoo Wildlife Area contain significant cultural and historical artifacts, which could possibly be damaged during fire suppression by equipment, and fire fighting techniques if care is not taken to minimize disturbance to these sensitive areas. Due to this concern, WDFW requests that the Incident Commander or other fire fighting personal on site notify WDFW personnel immediately in the order listed below. A WDFW Advisor will provide information to the Incident Commander regarding cultural and historical sensitive areas.

Aerial Support: Depending on location some fires on the wildlife area may be easily extinguished with ground equipment. However, because some of the wildlife area is not accessible by road, aerial support may necessary and appropriate to fight fire in some areas. WDFW requests the Incident Commander to seek aerial support if in their best professional judgment it is necessary to keep fire from spreading to private land or to private structures that may border the area or it is apparent that the fire cannot be controlled effectively with ground equipment due to access or other factors.

Reporting: Report any fire on or adjacent to all units of the Shillapoo Wildlife Area by contacting the local fire districts (See contacts below). It is absolutely critical that any fire on the area is attacked as soon as possible.

Fire Districts – DIAL 911

SATELLITE UNIT	FIRE PROTECTION ENTITY	PHONE
Vancouver Lake Unit, South Unit	Vancouver Fire District	(360) 892-4323
North Unit (western half)	Vancouver Fire District	(360) 892-4323
North Unit (eastern half)	Clark County Fire District #6	(360) 576-1195
South Unit (northeast corner)	Clark County Fire District #6	(360) 567-1195

DNR- contact in order listed and request Operations or Staff Coordinator

NAME	TELEPHONE
DNR forest fire reports	1-800-562-6010
DNR Castle Rock Field Office	(360) 577-2025

The following table provides telephone numbers in priority order of Department staff to be contacted in the event of a fire.

Department of Fish and Wildlife - contact in order listed

NAME	TELEPHONE	PRIVATE TELEPHONE	CELL
Brian Calkins, Wildlife Area Manager	(360) 906-6725		(360) 931-2592
Daren Hauswald, Assistant Manager	(360) 906-6756		(360) 931-3684
Mark Hart, Fish & Wildlife Officer -or- Rick Webb, Fish and Wildlife Sergeant	(360) 260-6333 (WSP dispatch)		
WDFW Regional office	(360) 696-6211		
Regional Wildlife Program Manager	(360) 906-6722		

APPENDIX 4. WATER RIGHTS

One surface water permit is associated with the Shillapoo Wildlife Area on the South Unit. This permit has not yet been finalized due to problems with the pump system. An extension is necessary in order to make the needed modifications to the pump station to fully utilize the water and submit the final proof of appropriation. The permit is described below.

File #	Cert #	Stat	Doc	Priority Dt	Purpose	Qi	UOM	Qa	IR Acres	WRIA	County	TRS	QQ/Q	Src's	1st Source
S2-29353		A	Pmt	02/02/96	WL	11.2	cfs	2500		28	Clark	03.0N 01.0W 36		1	Columbia R.

APPENDIX 5. VANCOUVER LAKE LOWLANDS BIRD CHECKLIST

Pied-billed Grebe
Red-necked Grebe
Horned Grebe
Eared Grebe
Western Grebe
Clark's Grebe
Double-crested Cormorant
American White Pelican
Ruddy Duck
Trumpeter Swan
Tundra Swan
Greater White-fronted Goose
Snow Goose
Ross's Goose
Emperor Goose
Canada Goose
Brant
Wood Duck
Eurasian Wigeon
American Wigeon
Gadwall
Green-winged Teal
Mallard
Northern Pintail
Blue-winged Teal
Cinnamon Teal
Northern Shoveler
Canvasback
Redhead
Ring-necked Duck
Greater Scaup
Lesser Scaup
Surf Scoter
Common Goldeneye
Barrow's Goldeneye
Bufflehead
Hooded Merganser
Red-breasted Merganser
Great Blue Heron
Great Egret
Cattle Egret
Green Heron
Black-crowned Night-Heron
Barn Swallow
Ruby Crowned Kinglet
White-faced Ibis
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk
Rough-legged Hawk
American Kestrel
Merlin
Gyrfalcon
Peregrine Falcon
Ring-necked Pheasant
California Quail
Virginia Rail
American Coot
Sandhill Crane
Wilson's Snipe
Greater Yellowlegs
Lesser Yellowlegs
Short-billed Dowitcher
Long-billed Dowitcher
Sanderling
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Sharp-tailed Sandpiper
Dunlin
Stilt Sandpiper
Ruff
Black-bellied Plover
Semipalmated Plover
Killdeer
Mew Gull
Ring-billed Gull
Herring Gull
Thayer's Gull
Glaucous-winged Gull
Glaucous Gull
Western Gull
Slaty-backed Gull
Bonaparte's Gull
Yellow Warbler
Yellow-rumped Warbler
Caspian Tern
Common Tern
Red-throated Loon
Pacific Loon
Common Loon
Rock Pigeon
Mourning Dove
Northern Saw-whet Owl
Long-eared Owl
Short-eared Owl
Belted Kingfisher
Vaux' Swift
Rufous Hummingbird
Red-breasted Sapsucker
Downy Woodpecker
Hairy Woodpecker
Northern Flicker
Pileated Woodpecker
Western Wood-Pewee
Pacific-slope Flycatcher
Western Kingbird
Blue Jay
Steller's Jay
Western Scrub-Jay
American Crow
Northern Shrike
Northern Mockingbird
Cedar Waxwing
Varied Thrush
Western Bluebird
Mountain Bluebird
Swainson's Thrush
Hermit Thrush
American Robin
European Starling
Brown Creeper
Marsh Wren
Bewick's Wren
Winter Wren
House Wren
Tree Swallow
Violet-green Swallow
N. Rough-winged Swallow
White-throated Sparrow
Golden-crowned Sparrow

Golden-crowned Kinglet
Black-capped Chickadee
Bushtit
House Sparrow
American Pipit
Pine Siskin
American Goldfinch
Purple Finch
House Finch
Orange-crowned Warbler
Nashville Warbler
Black-throated Gray Warbler
MacGillivray's Warbler
Wilson's Warbler
Common Yellowthroat
Spotted Towhee
Clay-colored Sparrow
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
White-crowned Sparrow
Dark-eyed Junco
American Tree Sparrow
Red-winged Blackbird
Tricolored Blackbird
Western Meadowlark
Yellow-headed Blackbird
Rusty Blackbird
Brewer's Blackbird
Brown-headed Cowbird
Bullock's Oriole